Symposium on psychoneurobiological conditioning

Thursday November 5, 2015
16:00 – 17:30 hours

Location: A1.20, Pieter de la Court

Health, Medical and Neuropsychology unit
Universiteit Leiden
The Netherlands

16:00 Introduction
Prof.dr. Andrea W.M. Evers,
Leiden University, The Netherlands

16:05 Insulin in the CNS: Unconditioned and conditioned effects of insulin on metabolism, food intake, and memory in humans
Prof.dr. Ursula Stockhorst
University of Osnabrück, Germany

16:40 Brain-immune interactions and the neural basis of disease-avoidant ingestive behaviour
Prof.dr. Gustavo Pacheco-López
Metropolitan Autonomous University, Mexico

17:15 Discussion
Insulin in the CNS: Unconditioned and conditioned effects of insulin on metabolism, food intake, and memory in humans

While initially only known for its peripheral actions, insulin is by now regarded to be an important neuromodulator in the brain. Animal experiments provide evidence that centrally acting insulin affects food intake, body weight, vagally-mediated peripheral insulin secretion, and memory. We examined the effects of acute and long-term administration of intranasal insulin on insulin-sensitive CNS-functions in healthy humans, i.e., on acute food intake, body-mass index, motivational aspects of food-intake, peripheral insulin secretion, leptin- and catecholamine secretion and blood glucose, and declarative memory. We also addressed Pavlovian conditioning of blood-glucose, insulin, leptin and catecholamines and assessed the differential sensitivity of the male vs. female human brain to insulin’s CNS actions. Since brain insulin signaling is impaired in patients with type-2 diabetes, Alzheimer’s dementia (AD) and mild cognitive impairment (MCI) the putative role of intranasal insulin as a preventive and/or therapeutic strategy to improve brain insulin actions is discussed.

Brain-immune interactions and the neural basis of disease-avoidant ingestive behaviour

Neuro-immune interactions are widely manifested in animal physiology. Since immunity competes for energy with other physiological functions, it is subject to a circadian trade-off between other energy-demanding processes, such as neural activity, locomotion and thermoregulation. When immunity is challenged, this trade-off is tilted to an adaptive energy protecting and reallocation strategy that is identified as ‘sickness behaviour’. In particular diverse disease-avoidant behaviours are evident in the context of ingestion, indicating that several adaptive advantages have been acquired by animals (including humans) during phylogenetic evolution and by ontogenetic experiences.

Ursula Stockhorst

Ursula Stockhorst is Full Professor of Experimental Psychology and Biological Psychology at the University of Osnabrück in Germany. She is focused on studying classical conditioning of pharmacological responses (e.g., endocrine parameters after insulin and glucose administration, conditioning of symptoms and immune parameters in cancer), effects of insulin in the CNS (e.g., on blood glucose regulation, food intake, and mood), classical fear conditioning in humans, sex hormones and emotional memory, and olfaction under metabolism. She is a member of the editorial board of Physiology & Behavior.

Gustavo Pacheco-López

Gustavo Pacheco-López is a consolidated neuroscientist focused on the studies of the complex interactions among the central nervous, immune and endocrine systems. He has an international authority on the neuro-immune associative learning as his studies have elucidated the neurological bases on the Pavlovian conditioning as modulator of the immune system. Moreover, he actively participated on the development and reappraisal of the therapeutic power of the Placebo Effects. More recently, he has actively contributed innovating and developing an evolutionary perspective of the human behavior in particular elaborating around the social neuroscience, testing hypothesis of the Brain-Immune interactions and the neural basis of disease-avoidant ingestive behavior and the effect of the Microbiota-Gut-Brain axis on the sociability and decision making processes. With an interdisciplinary approach he successfully incorporates cutting edge methods, such as fMRI, next-generation DNA sequencing, indirect in vivo calorimetry, biopotentials telemetry, among others.